TRAIL & Landscape

A PUBLICATION CONCERNED WITH
NATURAL HISTORY AND CONSERVATION

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T R A I L & L A N D S C A P E

Editors: Anne Hanes
749-2400 18 Briarcliffe Drive,
Ottawa, Ont. K1J 6E4
Sharon Godkin
Joyce Reddoch

Production Staff:
Marjorie Bond
Leone Brown
Dorothy Greene
Rosemary Wallbank

Business and Production Manager: Harry A. Thomson

THE OTTAWA FIELD-NATURALISTS' CLUB
- Founded 1879 -

President: Dr. Ewen C.D. Todd, 1818 Paisley Ave., Ottawa
Corr. Secretary: P.J. Narraway, Box 3264 Stn. C, Ottawa

Objectives of the Club: To promote the appreciation, preservation and conservation of Canada's natural heritage; to encourage investigation and publish the results of research in all fields of natural history and to diffuse information on these fields as widely as possible; to support and co-operate with organizations engaged in preserving, maintaining or restoring environments of high quality for living things.

Club Publications: *THE CANADIAN FIELD-NATURALIST*, devoted to publishing research in natural history. *TRAIL & LANDSCAPE*, a non-technical publication of general interest to local naturalists.

Field Trips, Lectures and other natural history activities are arranged for local members. See inside back cover.

Membership Fees:

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TRAIL & Landscape

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At the ANNUAL GENERAL MEETING on 19 January the 1975 Council reported to the membership and the 48 members present elected a new Council. As is customary, the complete report will appear in The Canadian Field-Naturalist.

During 1975, recommendations contained in a study of "Club Policies and Management Practices" were being gradually implemented. Some committees were combined or reorganized under clearer terms of reference.

The FINANCE COMMITTEE established interest-bearing funds for the Club and for The Canadian Field-Naturalist. A bequest was received from Rowley Frith's estate.

The MEMBERSHIP COMMITTEE thanks those who responded to appeals for assistance. Total membership in 1975 went up slightly, from 1275 to 1371; locally from 626 to 665.

The CONSERVATION COMMITTEE worked hard on briefs, letters, oral presentations and field studies. BUT -- "The effort required adequately to face the conservation problems of the Ottawa-Hull region is far greater than the time, talent, and information which have been offered by Club members to date; more effective action will require more effort by more people."

The PUBLICATIONS COMMITTEE selected a new printer for The Canadian Field-Naturalist. Its publication was assisted by a National Research Council grant of $8500.

The EXCURSIONS AND LECTURES COMMITTEE organized the usual staggering program: 53 events in 1975.

The MACOUN FIELD CLUB continued most of its customary activities in 1975, with a change of Chairman, and a move into a new clubroom in the Museum in October.

The EDUCATION AND PUBLICITY COMMITTEE prepared displays, and found field trip leaders and speakers for a number of outside groups, and Science Fair judges (environmental).

The BIRD RECORDS AND BIRD FEEDERS committees operated actively as in past years.

A CENTENNIAL COMMITTEE was newly established to receive proposals to mark our 100th Birthday in 1979.

"New Business" included two appeals for volunteer help: drivers for Sunday field trips of the Macoun Field Club, and varied types of help for the Canadian Nature Federation's annual convention in May. Questions raised related to finances and Centennial projects. G. Neville's proposal that the Club acquire land had been discussed by the Council and evidently considered impractical, at least in the form in which it was received. At the annual meeting, members were asked to indicate by a show of hands their interest in attending a meeting, if one were arranged, with invited speakers from clubs which own and operate nature reserves. About a dozen hands went up.

Six members each showed and commented on a clutch of slides, the varied subjects and styles providing a most enjoyable entertainment. President Todd showed a short movie he had made on the OFNC trip to the Saguenay in October; a pleasant reminder to those who had been there, and a glimpse of what stay-at-homes missed.

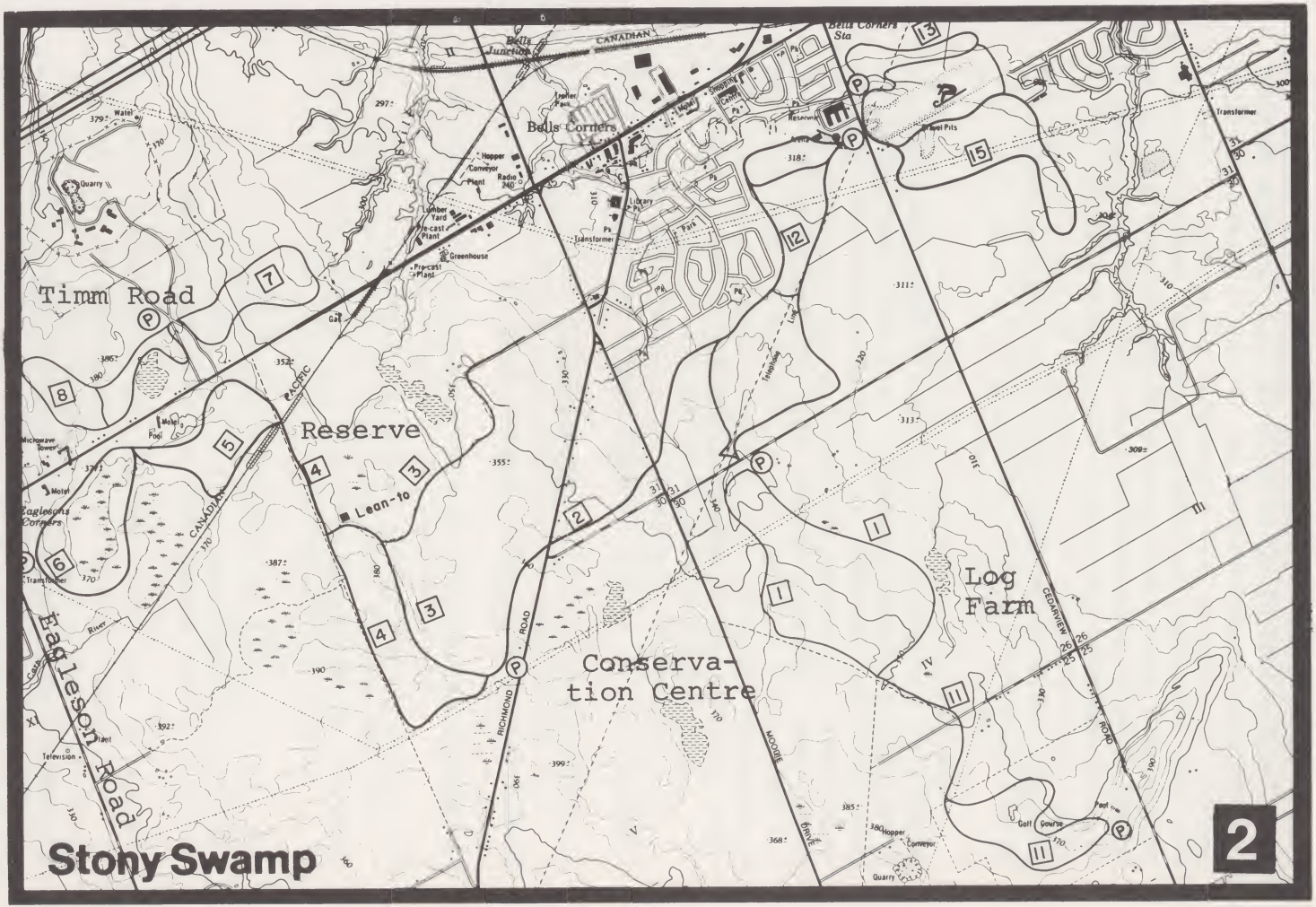
THE 1976 COUNCIL

President	Ewen Todd
Vice-President	Roger Foxall
Treasurer:	Pamela Sims
Recording Secretary:	Tony Erskine
Corresponding Secretary:	Patricia Narraway

Others:

E. Beaubien	J. Murray
W. Cody	M. Ney
A. Dugal	G. Oyen
D. Gray	R. Taylor
H. MacKenzie	S. Teeple
D. McClymont	S. van Zyll de Jong

The Council meets on the 3rd Monday of each month except July and August. Interested members are welcome to attend. Check location with a Council member.


Timm Road
Reserve
Lean-to
Log Farm
Conservation Centre
Eagleson Road
Stony Swamp
Bells Corners
Bells Junction
Bell Corners Sta
CANADIAN PACIFIC
RICHMOND ROAD
MOODIE DRIVE
CEDARVIEW ROAD
Eagleson Corners
Golf Course
2

ENVIRONMENTAL MANAGEMENT IN THE STONY SWAMP

If you are a cross-country skier and you ski the Western Greenbelt, you will have noticed that changes have been made in the trail system. You are also probably wondering what the National Capital Commission had in mind by closing parking lots and relocating trails. This article will hopefully clarify the situation and show that there was "method in our madness".

Nordic skiing has undergone a phenomenal increase in popularity in the National Capital Region. Last year, up to 1,200 persons per day used the Stony Swamp trails. This number of people concentrated in such a small area can be expected to cause problems, such as: overuse of trails causing icy conditions, disturbance of wildlife, damage to vegetation by skiers leaving the trails, diminishing of the outdoor experience, and disturbance of environmental education activities being carried on at the Conservation Centre. It was clear that to prevent further damage and disturbance, a reorganization of the trail system was required before another winter. After an analysis of the situation, it was decided that the solution was to distribute skiers over a wider area and attract them away from the Conservation Centre. The trail map shows the results of this realignment.

The first step was to move the focal point, the Nordic Nook, away from the sensitive area. It is now located on Cedarview Road, just south of the Bell Arena. New trails have been added in this vicinity, with a series of expanding loops for skiers of varying stamina. Trails have been closed near the Conservation Centre and in the reserve, an area set aside for wildlife (particularly deer, which winter there) and low-impact environmental studies. Trail 3 through the reserve remains as an access route from Bells Corners. Trail 1 has been moved away from the Log Farm. To compensate for the loss of trails and to expand the system to its estimated carrying capacity (1,200 persons/day), new trails have been added on Timm Road north of Highway 7 and at the Cedarhill Golf Course. The addition of trails in the Leitrim area and in the south end of Gatineau Park should also help to relieve the pressure on the Stony Swamp.

Use of the trails is to be regulated by parking lot size and number. Parking lots have been closed in the Conservation Centre area and at the dangerous location on Highway 7, and new lots opened on Timm Road, Eagleson Sideroad, and Cedarview Road. Parking is also available at the golf course. The size of each lot reflects the carrying capacity of that trail; when the lot is full, the trail is at capacity.

The new system offers 42 kilometres of trails. The loops permit a skier to choose a trail of length, difficulty, and interest suited to his or her needs. Three trails will be mechanically groomed this year. If successful, grooming will be extended to other heavily used trails next year. Lighted trails and rental services are available at the golf course.

Problems with the new system are expected, but co-operation and self-restraint of skiers should help to alleviate them. Skiers can assist by using only marked trails and parking only in parking lots. (Parking along the roads will defeat the planned regulation of numbers by parking lot size.) The Jack Pine Trail is reserved for hikers and snowshoers only, and skiers are requested not to use the Rideau Trail through the Stony Swamp. Naturalists may want to do some off-trail exploring; remember, however, that any track you make may be followed by others.

The new trail map is available from N.C.C. at 48 Rideau Street and information can be obtained at 232-1234 or 992-3323. You may want to go further afield to find less-travelled trails. Other areas offering skiing are Larose Forest, Limerick Forest, Lanark County Forest, Kemptville Nursery Forest, Ottawa-Carleton Forest, Fitzroy Provincial Park, and Foley Mountain Conservation Area.

Stewart E. Hamill
N.C.C. Interpretation

N.C.C. office is only open during working hours which makes it difficult for many people to drop by for a map. However, N.C.C. trail maps are available Saturdays from the tourist information centre located at the Elgin St. entrance to the N.A.C. (opposite to Classic Book Shop). There is also an O-C Transpo route map centre there. (S.G.)

Editor, T & L

It is nearly eight years since I wrote my first letter to T & L. At that time we were newly settled in the Hardwood Plains area and full of the wonder and pleasure of exploring the natural environment around us and the creatures it supported. Each year brings something new for us to observe -- some good, some not so good. A new bird or two is identified; one winter a one-legged grackle frequented the bird feeder; beaver built a dam in the stream and felled my birch, maple and poplar trees; mink have been sighted in the stream. Several busloads of school children have made Nature Study field trips here. The Regional Road 9 has been widened, raised and "improved" and now boasts deep rocky ditches, the surplus rock being dispersed to fill in ponds such as the one on River Road where "Amphibians in Spring" outings were conducted. The reclaimed area sports two new houses.

The OFNC and T & L have done much to broaden and enhance our interests in the natural world around us. But it has done more than improve our knowledge. For me it has offered a fellowship and proven a remarkable degree of caring and sharing. There are members who participated in the Nature Photography Workshop excursion to Meach Lake last 28 September and who assisted in the rescue operations after I sustained multiple injuries from a fall into a rocky riverbed. There are members who visited and telephoned me during my convalescent weeks in hospital. There are members who prepared meals, baked, and expressed care and concern for my children during the emergency. There are members who have followed my recovery since my return home. Recovery is a gradual but steady process. By next fall I hope to again participate in the field excursions.

To all members my deepest appreciation and heartfelt thanks for the care and comforting support received by the children and myself during those anxious times.

I am particularly grateful to those persons whose professional skills were instrumental in facilitating a successful rescue.

Yours sincerely,

M. K. Wilson
Harwood Plains
R.R. #1, Kanata, Ontario K2K 1X7

P.S. Incidentally, I have an unclaimed ladies' navy blue sweater and ladies' blue-grey "Head" ski and sportswear shell that were among items on the stretcher. Owners please contact me.

RABIES CONTROL

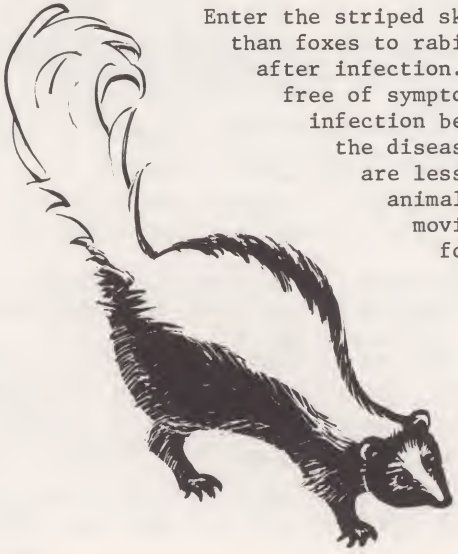
EXPERIMENTS IN BEHAVIOURAL ENGINEERING

by Charles D. MacInnes and David H. Johnston
Research Scientists, Fish and Wildlife Research Branch
Ontario Ministry of Natural Resources

As human populations become more dense, interactions between man and wildlife will inevitably become more numerous. If we are to have wildlife in future environments, both man and wildlife will have to change their behaviour. We name the business of persuading wildlife to change their ways 'behavioural engineering'. The experimental project we want to discuss is only one part of a comprehensive program aimed at reducing the incidence of rabies in Ontario. It is a joint venture of three Ministries: Agriculture and Food, Health, and Natural Resources.

Rabies is a virus disease which kills a wide variety of animals from man and mouse to cow and dog, from fox and skunk to bat and cat. Rabies became established in wildlife in Ontario between 1954 and 1956 and has remained a serious problem to this day.

The picture is complex. The chief trouble-maker is the red fox which passes rabies to farm animals and pets which, in turn, expose humans to the disease. Foxes die so quickly once rabies symptoms develop that, in theory at least, the disease should die out because it causes foxes to become so rare that there can be little chance of a rabid fox living long enough to bite a healthy one and pass the disease. Of course, the disease will not die out if other wildlife harbour it and pass it back to foxes.



Enter the striped skunk. Skunks are less susceptible than foxes to rabies, and they live much longer after infection. Captive skunks have remained free of symptoms for as long as one year after infection before abruptly coming down with the disease. Skunks with rabies symptoms are less dangerous to man and domestic animals because they are much slower moving and less aggressive than rabid foxes. But beware! A bite from a rabid skunk is more likely to

Skunks are prime suspects

pass on the disease. We are not yet sure whether skunks are the key to keeping rabies around, but they are prime suspects.

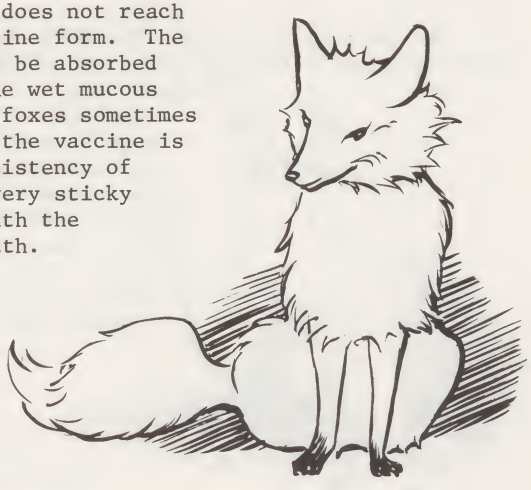
Serious rabies outbreaks occur about every third year when a local fox population has built up from the last outbreak. In the fall, young foxes break away from their family party and strike out, looking for a home range of their own. They may travel many miles, and they appear to be under considerable stress from encountering new country and new animals. Certainly, they are very susceptible to rabies, and their travels carry the disease a long way.

How to break this cycle? New York State hired professional trappers and tried to trap foxes to extinction. But the State still has foxes and rabies. Alberta succeeded in reducing the strength of an outbreak by poisoning carnivores, principally coyotes which were the main vector in that province.

In case it seems logical to eliminate foxes and skunks together, you should know that other carnivores, such as weasels, may be important reservoirs. Bats also carry rabies and may spread it over large parts of North America in their migrations. The origin of rabies in our native bats is uncertain, but they may have been infected by vampire bats in Central and South America.

Try another approach. Vaccinate! And here is our problem in behavioural engineering -- getting the fox to take the vaccine.

Connaught Laboratories Limited has a vaccine which, taken by mouth, will stimulate immunity to rabies in foxes. But it isn't all that simple. The vaccine is a modified living virus, and therefore, in most circumstances, it is sensitive to external conditions. In the stomach of a fox, digestion breaks it down chemically so that it does not reach the bloodstream in the vaccine form. The best place for the virus to be absorbed into the body is through the wet mucous tissues of the mouth. But foxes sometimes bolt their food. Luckily, the vaccine is in a form that has the consistency of spongy taffy, and it gets very sticky when it comes in contact with the moisture in an animal's mouth.



The chief trouble-maker
is the red fox

The best way to keep the vaccine alive for a long period is to freeze-dry it. A combination of warmth (room temperature) and moisture destroys its effectiveness in a few hours. So the vaccine, grown in tissue culture, is frozen, and then all the water is removed by placing the frozen medium in a vacuum. When completely dry, it can stand temperatures up to 100°F and remain potent for days or weeks. But to keep it dry, it must be in a sealed package for, like table salt, it picks up moisture from the air.

Great! We have a vaccine that sticks in the fox's mouth. But to keep it in this form, it has to be sealed in an air-tight package. Currently, we use a little plastic bag. More behavioural engineering. How do you get a fox to find a plastic bag, tear it open (rather than gulp it down), and chew the contents which look like nothing it has ever seen before?

To stop an outbreak, a high percentage of the foxes in a rabies area must eat the baits. Some authorities feel we have to reach 70 per cent of the foxes, but this we still have to verify in wild populations.

Let's take it in steps. Get the fox to the bag, or the bag to the fox. We are trying both tacks. Foxes can be attracted by a number of tricks, as any trapper knows. Fox urine sprayed on a bush creates a scent which attracts foxes from some distance. We have tried over 40 edible substances which have a far-carrying smell. (Ever try to buy 200 pounds of Limburger cheese all at once?) Currently, the best candidate is slightly rotten hamburger. There are indications that we may be able to pull foxes in for some distance by putting out an edible bait weeks before we put out vaccine bags.

Remember, the rabies stricken area in Ontario is about 30,000 square miles. It may take 150 or more baits to the square mile to vaccinate enough of the foxes and skunks, as many are eaten by mice and other species. Therefore, any trick we can use to reduce the number of baits required, even by 10 per cent, will save a lot of money if we are ever able to mount a control program.

Now we have the fox to the bait, how do we persuade him to open the plastic bag? A major breakthrough came about almost by accident. We wanted to know what happened to baits which foxes carried away from where we left them. Did they eventually eat them, bury them, or just drop them? To find out, we put miniature radio transmitters in bait bags -- and here came a big surprise. With normal baits, foxes carried away an average of three out of every ten baits. But add a radio, and they took eight out of ten.

Weasels may be important reservoirs

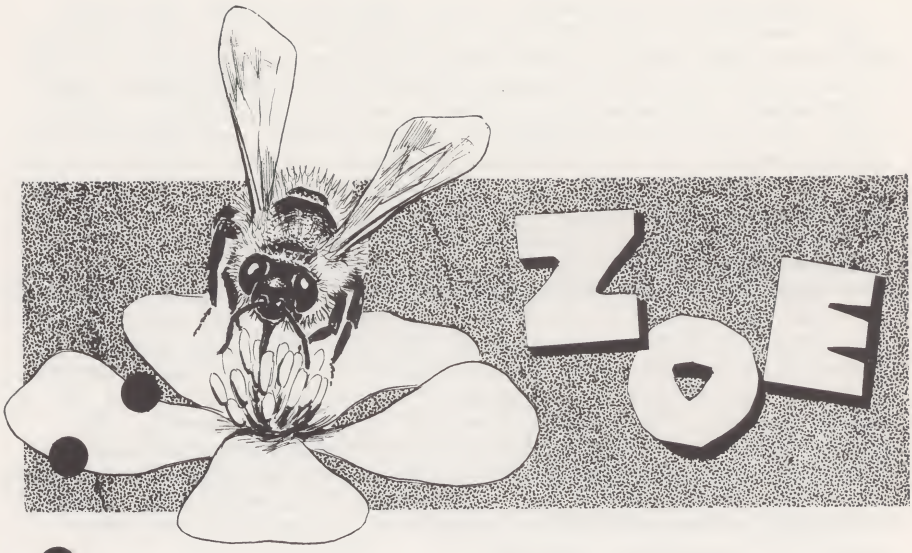
Then realization dawned. If we offered you two paper lunch bags, which you could not open, and told you to take the one that had your lunch in it, and one had contents weighing less than half an ounce (a freeze-dried hamburger) while the other hefted a good eight ounces (balled-up paper with a rock in the middle), which would you take? Well, apparently any fox knows, just by picking up a bag, that if it feels so light it can only be full of air, it's not worth investigating. Solution -- put a small (clean) rock in with the vaccine before you freeze-dry it, and it will be much more intriguing to a fox. We have also tried flavouring the vaccine. This is tricky because the virus is killed by many substances. Beef bouillon, added before freeze-drying, seems to help the flavour.

There is another behaviour problem we haven't tackled yet. Foxes, like humans, don't like bits of polyethylene bag in their food, so many chew the meat-smeared bag but never get to the vaccine pellet inside. This is a problem for a packaging expert. What tasty substance can (1) be made into a moisture-proof package into which we can pour a liquid broth; (2) be put through a freezer-drier for 72 hours; and (3) be sealed air-tight afterward? And we want to be able to make 600,000 or more baits per year at the lowest possible cost. Ideas, anyone?

We have used over 30,000 bait bags in field trials. None of these bags contained vaccine, and the contents were harmless to man and animals. We use the same medium, and make them the same way as the true vaccine baits will be made, so that the baits we test are as close to the real thing as possible. But the vaccine needs more safety testing before it can be released for use in the field.

Connaught has a vaccine which works in the laboratory and has passed every test so far. The Ministry of Natural Resources research group have learned a lot about delivering the bait to the target animals -- foxes, skunks and other wildlife. But there is more to learn about the ecology of rabies vectors before we can guarantee a control program.

Coyotes were the main vectors in Alberta



. . . a bumblebee

Isabelle Nicol

The warmth of the spring sun reached Zoe in the hollow log where she had sought refuge during the cold winter months. It brought her out into a world which was new and green, and she basked in the warmth of the sun's rays. Alive and well, she sought food in the newly opened flowers, and nights were spent under the litter of the forest floor. When the world turned cold again she remained in her resting place till the warmth of the sun stirred within her anew the desire to get about her life's task.

Three weeks later, zigzagging low over the ground, Zoe covered miles searching for a nest site. She spent minutes at a time investigating the subterranean passages of moles, voles, mice and chipmunks. She checked over banks of earth and weed-covered gardens, peering into every nook and cranny. She settled down at one likely-looking hole and disappeared inside but came back out hurriedly with the occupant, a large black spider, in pursuit.

Zoe was finally captivated by an abandoned cozy-looking little mouse hole, and settled down to maternal domesticity. She fashioned a small inner chamber using only the finest grasses and roots already available in the nest. From time to time she would leave the nest to eat pollen and drink nectar. Pollen contains large amounts of protein and Zoe needed this protein to build up in her ovaries the eggs she would later lay.

OFNC ANN

with John and Janet Foster
presenting slides on
"The Wild Regions of Canada"

John and Janet Foster have done much to popularize the spectacular and remote areas of Canada. Their superb films have been presented in a popular TV series "To The Wild Country". Last year, in a book by the same title they once again led us on a tour of natural areas, illustrated with a collection of their best photographs.

In their nature photography, John and Janet emphasize the importance of capturing the subject undisturbed in its natural environment. Both have had their photographs exhibited and published by the National Film Board of Canada.

We are proud to have John and Janet Foster as our guest speakers at this year's OFNC Annual Dinner. For their slide talk, they will show slides and talk on many of their favourite areas in Canada, starting from the Pacific Coast then through to Newfoundland. Finally they will return to one of their favourite areas, Algonquin Park, where they spend much of their spare time camping, wilderness hiking, and canoeing. Throughout the talk they will give us tips on camera techniques we can all use.

It all adds up to one of our best Annual Dinners ever. We hope to see all of you there.

UAL DINNER

Tuesday, April 20, 1976

Dinner: 7:30 p.m. - Social hour 6:30-7:30 p.m.

Place: Centennial Ballroom
Talisman Motor Inn
1376 Carling Avenue (at the Queensway).

Reservations: To order tickets fill in the order form below and send it along with $9.00 per ticket before April 1 to:

Ottawa Field-Naturalists' Club
c/o Mrs. E.M. Dickson
2037 Honeywell Avenue
Ottawa, Ontario K2P 0P7

For further information contact Elaine Dickson (729-1554)

ORDER FORM

Name (please print)_____

Address_____

_____phone_____

Please send me ___ tickets to the OFNC Annual Dinner at $9.00 per person. Enclosed please find my cheque or money order for $_____.

Zoe was a good-natured creature and always intent upon her business but sometimes she had to defend herself. One time as she was busily sipping nectar from a flower, she was spotted by a robber fly -- a swift predaceous insect which struck its victim from above and wrapped its long hooked legs about its prey; with the first thrust of its beak it would inject a paralyzing anaesthetic, then proceed to suck out the soft interior of its victim. This particular robber fly, which bore a remarkable resemblance to Zoe, was lurking on a twig-tip near to where she was working. Immediately he launched himself at her. As Zoe backed out of the flower, she caught sight of her enemy and flew up to meet him in the air. They grappled with each other, then fell to the ground. The big fly repeatedly tried to stab Zoe in a vital area but she was too quick for him. Rolling over onto her back, biting and squirting venom into the air, she finally found her mark and thrust her powerful sting into the fly, killing him.

Back in her nest Zoe began to build a little honeypot. Being well-fed, her body was beginning to produce wax which she used to make the honeypot. Wax scales exuded from glands between the segments of her furry abdomen and she removed them with her legs and then manipulated and worked the wax with her mandibles. Zoe's honeypot wax differed from honeybees' comb wax in that she mixed it with pollen; it was darker in colour and softer. Into this little pot, which resembled a thimble, she regurgitated a watery mixture of pollen and nectar. This was a reserve food supply to be used by her during colony founding should bad weather occur, and also by her young when they emerged as adult bees.

Now, in the centre of the nest, Zoe began to build a quarter-inch waxen cradle, but before depositing her eggs in it, she half filled the cell with a golden pollen mattress, smoothing it carefully, then proceeded to lay ten eggs on top of the pollen. She sealed the cell with a coverlet of wax which gave it a spherical appearance. Then, like a little broody hen with her plump matronly figure, she sat on her eggs, covering the waxen cell with her furry body, and hugging it with her legs. Except for quick, hurried trips afield for food she didn't leave them till they hatched.

Out of these eggs about five days later came little larvae which devoured their golden mattress. They were also fed by their mother. Zoe would make an opening in the cell with her mandibles and regurgitate a mixture of pollen and nectar into the cell from her honey-stomach, or crop, so that her offspring were literally sitting in their meal as they ate it. She would then reseal the cell. The larvae grew rapidly and moulted from time to time as their skins became too tight. The digestive system of Zoe's offspring in the larval stage was not complete so they did not void any wastes, therefore not fouling their bed. Sharing a communal bed as they did, this was probably just as well, considering also the fact that they had their food squirted onto and around them. As these little larvae became pupae, their digestive systems became complete and their wastes were excreted.

Now each larva spun about herself a yellowish, silken, egg-shaped cocoon, and while each of Zoe's offspring was involved in the silent transformation from larva to bee in the darkness of her respective cocoon, her mother the queen removed what was left of the waxen cell which had originally enclosed the brood, and left exposed a group of cocoons. Throughout the egg, larval and pupal stages of these, her first offspring, Zoe continued to incubate them, to give them the warmth needed for their proper development. As the overall size of her brood increased through the growth of each individual, her body could no longer cover the whole brood. So she would lie in the centre, actually creating a groove in the brood where she lay. The warmth from her body reaching those in the centre would cause them to develop more quickly, and they would emerge as adults before the ones on the perimeter.

As these, the first brood, were developing, Zoe had started a new cycle by creating a second egg cell, using the wax she had removed from the initial cell. But for subsequent broods it would not be necessary for her to incubate them, as the previously produced broods would already be contributing considerable warmth from their own bodies due to the metabolism of their rich food supply.

Her metamorphosis complete, each young bee from the first brood cut a circular piece from the top of her cocoon, with Zoe's help. It had taken approximately three weeks from the time Zoe laid the eggs for these first true bumblebees to emerge. As these weak little bees emerged, smaller than those from subsequent broods would be, they staggered to the honeypot and drank long draughts of the sweet liquid before returning to, and snuggling under, the warm protective body of their mother. As yet they did not have the colourful black and yellow garb of their mother, but were a silver-gray, and known as callows. Not until the third day would they acquire the mature colour of the bumblebee, and be flying afield. In the meantime they would be drying out, and their tough, transparent wings expanding and hardening.

These little bees were smaller than normal because they matured at a time when Zoe had to do all the work and was unable to supply them with as much food as the larvae produced in later broods would receive, when many workers would be available to help.

This was the beginning of Zoe's colony, and she was the queen of it. Unlike the queen wasp or honeybee, she would not simply become a mere egg-laying machine, but would still make egg cells, feed larvae, and occasionally forage afield with her daughters for pollen and nectar to sustain the colony. Also, unlike the queen hive bee, she was independent of her daughters' ministrations and would comb and groom herself.

Zoe's colony was beginning to grow. As these young adults emerged they took over much of the work of food collection, wax making, and care of the young. As baby bees emerged, their cocoons were used for food storage. The workers would clean them, their edges would be smoothed off and strengthened with additional wax until they were about two or three inches tall. The workers would

return from the fields with nectar in their crops which was regurgitated into these food storage cocoons. The stored nectar would thicken by evaporation and gradually become honey. The storage cocoon would then be capped. Because Zoe's colony would not survive the coming winter, there was no need to store large amounts of honey as in the hive of the honeybee. Although Zoe's colony was fairly large, its content of honey came to less than a cup. As well as being used for storing honey, the cocoons were used to hold pollen.

Both pollen and nectar were gathered from blossoms on the same trip. Pollen, a powdery yellow substance, would stick to the furry body of a worker whenever she crawled down into the centre of a flower to drink nectar. She would comb it out, combing it toward her head where she moistened it with nectar, then stuffed it into little pollen baskets formed by fringes of long curved hairs surrounding the outer surfaces of her legs. Sometimes these baskets were so loaded with pollen that the worker had trouble flying because of the weight of the enormous golden ball on each of her hind legs. On returning to the nest the worker would stand with her head away from the cocoon, now being used for pollen storage, and with her middle leg remove the pollen from her hind leg basket, pushing it into the cocoon.

The worker did not get all the pollen off her body when combing herself, and some of it would be smeared onto the next blossoms she visited, thus pollinating them. When working a field of flowers, the bees generally stuck to the same type of flower until the nectar gave out, thus ensuring fertilization in that particular species of plant.

These female worker bees were well equipped to look after themselves. Each had a stinger, actually a modified ovipositor or egg-laying tube, which acted much like a hypodermic needle. It was a shaft consisting of two prongs with a groove in each one. When she stung, the worker would work one side down and then the other. Poison would be released from sacs at the base of the sting and run down the grooves in each side. The sting, about a quarter of an inch long and sharper than a needle, could be withdrawn to sting again although the venom supply would become temporarily exhausted after she stung a few times in succession. Only the female members of the colony were so equipped.

Now that Zoe's nest was well established it had a rather constant temperature, several degrees higher than the outside temperature. The developing brood produced heat from the digestion of their food as did the adult bees going about their work in the nest. The nesting material about the comb served as insulation and aided in temperature control. When the nest did become too warm, the workers would fan their wings to create cooling air movement.

One day there came to Zoe's home a visitor, a degenerate relative by the name of Psithyrus. The workers met her with hostility and tried to repel her by attacking her in such numbers that she was completely covered by a mass of bumblebees. They rolled back and forth during the struggle, the workers trying to

sting Psithyrus who had a harder, heavier body than theirs. Many of the workers were fatally injured in the melee. Finally one of the workers stung Psithyrus in the neck, killing her.

Had Psithyrus gained entrance into the nest, the workers would have become submissive and accepted her. She would have usurped Zoe's position as queen, perhaps even killing her. She would have parasitized the colony by laying her own eggs in the cells, and Zoe's daughters would have cared for these "cuckoo" young. No more offspring from the original foundress would have been produced, for Psithyrus would have destroyed the eggs, and from her own eggs would have come only males and fertile females; no workers being produced. For by exploiting her relatives, no workers of her own were needed. And her own female offspring would have continued the cycle of parasitism in the nests of other bumblebees the following year.

There was also a little beetle which gained entrance into Zoe's nest by using an interesting stratagem. It hid in the flowers which the bumblebees visited and when a bumblebee alighted, attached itself to one of the legs. Once in the nest it laid its eggs and the larvae lived on the refuse in the colony.

As summer progressed Zoe began to lay fewer eggs, and as it drew to a close, some of the eggs hatched into drones and some into queens. Zoe was quite capable of deciding which eggs would develop into workers, queens, or drones. As an egg passed down her oviduct she could release or not release a spermatozoon from the spermatheca (a sac leading off the oviduct) to fertilize it. If fertilized the egg generally resulted in a sterile female or worker; if not, a drone. Queens resulted from fertilized eggs, but the quantity and quality of their food caused queens to result rather than workers.

The drones' sole function would be to mate with and fertilize the young queens during a mating flight. But until that time they were independent fellows, sustaining themselves outside the nest by foraging for their own food. They spent many hours atop twigs or other foliage and buzzed any insect resembling a queen which passed by. The young queens did some foraging and helped with the chores of the colony.

With the emergence of the queens and drones, no more worker broods were reared. This would have been wasted effort, for autumn was near and they would all die anyway. Only the young queens would hibernate throughout the winter. The spermatozoa obtained during the mating flight would be stored in the spermatheca where they would remain viable throughout the winter and would fertilize all the eggs laid during the following year, which could number up to 1,000. These queens would not mate a second time.

Zoe began to age quickly. She lost all her hair and could no longer lay eggs. With the coming cold she and all her offspring, except for the fertile females, would die. But she had served her purpose in her very existence for she had brought into being about five hundred offspring who, with a myriad of other insects, had helped in the formation of the fruit and seeds of many plants by pollinating them, and which simply would not exist but for these insects.

In fact, the bumblebees are worth millions of dollars to the farmer, for on them the red clover crop depends. Red clover, which has a narrow tube-shaped flower, is dependent on the long tongue of the bumblebee for pollination, for alone among the bees, it is able to reach the nectar deep in the red clover blooms. No farmer in the world could raise red clover without the bumblebee.

And so Zoe's nest fell to its last heirs, the scavenging beetles and wax moth larvae, which began demolishing the egg cells and honeypot. Secreted away in crannies in the ground or old logs were the queens who would start the cycle over again and be seen as the early shrubs came into bloom, humming and zigzagging low over the fields on their own respective missions.

THE NATIONAL AND PROVINCIAL PARKS ASSOCIATION OF CANADA
OTTAWA - HULL CHAPTER

A N N U A L M E E T I N G

Algonquin Park Master Plan

will be the topic of a slide illustrated talk by
Mr. Andy Brethour
of the Ontario Ministry of Natural Resources

National Museum Auditorium,
Metcalfe & McLeod Streets,

Monday March 8, 1976 8:00 p.m.

Admission Free - Everyone is welcome to attend

from: FISHES OF CANADA'S NATIONAL CAPITAL REGION

by D. E. McAllister and B. W. Coad

LONGNOSE DACE Rhinichthys cataractae (Valenciennes)

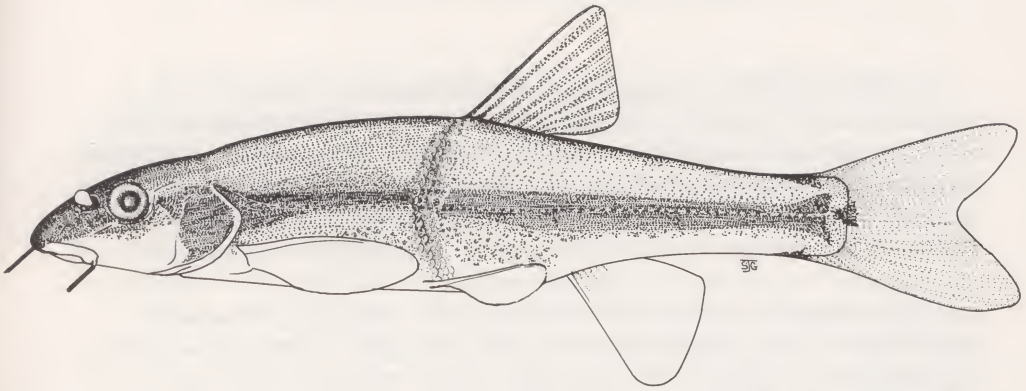
Distinguishing Features The longnose dace may be separated from other minnows of the region by the small barbel at the hind corners of the mouth and lack of a groove separating upper lip from snout. In addition the mouth is U-shaped and on the underside. The snout projects markedly over the mouth.

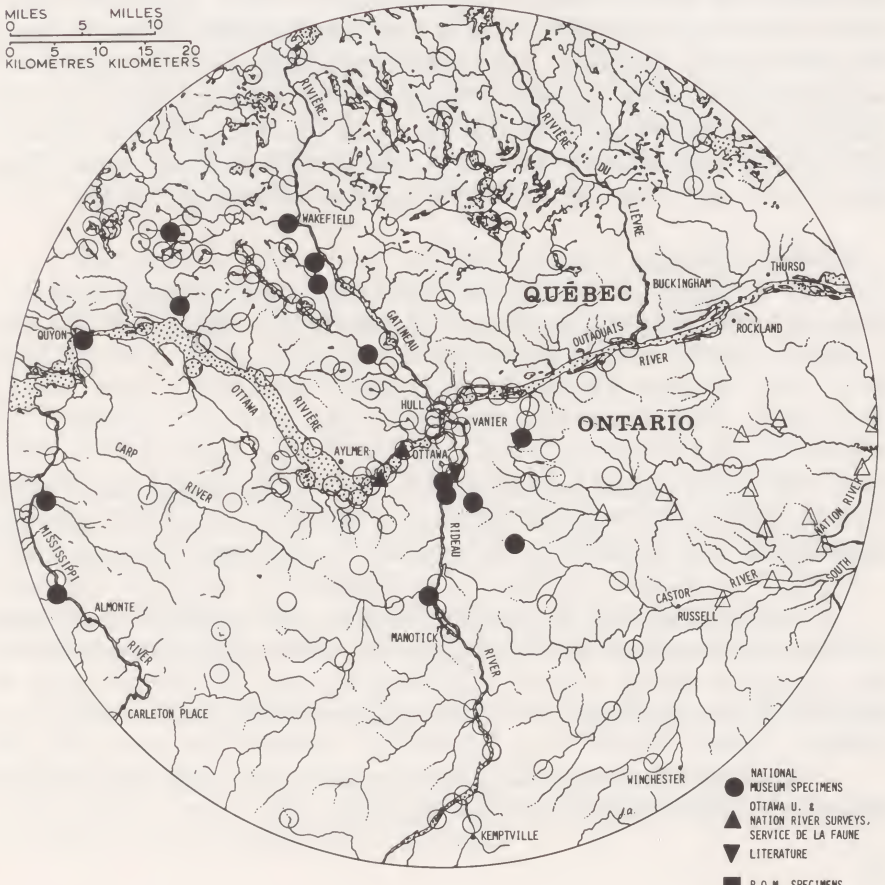
Description Body rounded, head region flattened. Small mouth below level of small eye. Lips thick, fleshy, resemble those of sucker. Nasal flaps conspicuous. Head length enters standard length 3.6 - 4.1 times, body depth enters 3.8 - 5.1. Ten dorsal and 9 anal fin rays. Dorsal fin begins behind level of pelvic fins. Pectoral fins large, particularly in male where they reach pelvic fins, and splayed outwards low on body. Axillary process present between both pectoral and pelvic fins and body. Lateral line straight, 59 - 69 scales. There are 6 - 8 short gill rakers, pharyngeal tooth count 2.4 - 4.2. Intestine short, S-shaped. Back dark green or brown becoming lighter as creamy or white underside reached. Lateral band across head; body ends in caudal spot. Groups of scales on back and sides may be darker, give mottled appearance. Body cavity lining silvery or white with darker flecks. Breeding males bear orange pigment on upper lip; bases of fins orange or pink. Tubercles evident on head, scales, and fins (less noticeable in females) in fish taken from mid-May to early September; well developed earlier in year. Our largest specimen is 5 inches total length, elsewhere reported to 7 inches. Described from 20 specimens.

Origin Longnose dace are believed to have survived glaciation in the Atlantic and Mississippian refugia.

Biology Longnose dace favor running water and may be found on the bottom of boulder-strewn streams with little vegetation. Breeding season elsewhere extends from May to August. In the region females carrying eggs 1.5 mm in diameter have been caught May 15 when water temperatures reach 17°C. The male is reported to guard a territory near the eggs, laid between stones in riffle areas. Up to 1200 eggs may be laid by each female, hatching in 7 - 10 days at 16 C. Young are pelagic but gradually move into deeper and faster water. Individuals 5 years old have been reported. Food items include aquatic insect larvae (blackflies, midges, and mayflies). (B.W.C.)

Source: The National Museum of Natural Sciences of the National Museums of Canada. Reproduced by permission of Information Canada and N M N S

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NATIONAL MUSEUM SPECIMENS
OTTAWA U. & NATION RIVER SURVEYS, SERVICE DE LA FAUNE
LITERATURE
R.O.M. SPECIMENS

APPEAL FOR BIOLOGICAL SPECIMENS

The Zooarchaeological Identification Centre is a service and research organization established in 1972 within the National Museum of Natural Sciences, National Museums of Canada, Ottawa. The Centre identifies and interprets animal remains from archaeological sites and identifies bones from biological projects. Since an extensive reference collection of skeletons of Canadian vertebrates is needed to adequately analyze fragmented bone found by archaeologists, the Centre has undertaken a program of skeleton acquisition. Members of the Ottawa Field-Naturalists' Club can be of great help to the Centre in this endeavour.

Many birds are found dead each year through accidental collision with picture windows, high towers, or cars. Most such specimens are probably in good enough shape to be made into reference skeletons, despite the fact that carcasses may be slightly rotted or have one or two broken bones. The Zooarchaeological Identification Centre would like to have these dead birds, in any quantity. Specimens should be labelled with date and place of collection, circumstances under which the bird was found and collector's name, and submitted to:

Anne M. Rick, Head
Zooarchaeological Identification Centre
National Museum of Natural Sciences
322 Catherine Street
Ottawa, Ontario K1A 0M8
Telephone 995-6017

All skeletons become part of the vertebrate collections of the National Museum of Natural Sciences and are available for study by scientists today and in the future.

Retrieving birds found dead is an example of conservation and maximum utilization of biological specimens, for if dead birds can be collected, no live ones need be killed for inclusion in the skeletal reference collection.

Certain small mammals, reptiles and amphibians found dead are also needed by the Centre.

BIRDS OF NOVEMBER AND DECEMBER 1975

The near fever pitch of birding in early fall subsided as the major waves of migrants headed for warmer climes. Yet, with the passing of 1975, we can look back on an interesting season, with such highlights as Red-throated Loon, King Eider and a possible Laughing Gull to brighten the period.

Undoubtedly the most confusing and controversial species was an immature Red-throated Loon that appeared November 2 on the Ottawa River at Britannia. Initially identified as a Red-throated while swimming far from shore, it was later re-identified as an Arctic Loon. A score of birders noted that it had a thin, straight rather than upturned bill, lack of white on the face, and small size, appearing to match the field marks of an Arctic Loon. This would have been a first for Ottawa, as well as a very exciting find in the east. However, on November 11 it was established beyond a doubt that the bird in question was a young Red-throated that had not yet developed the characteristic face pattern and upturn of the bill. The "V" patterning of the back was the conclusive field mark used to determine the identification in comparison with skins in the National Museum collection

The duck build-up at Shirley's Bay again produced a long list of very interesting sightings. This includes the season's only Snow Goose on November 29, an immature bird in the blue phase; an unprecedented concentration of Ruddy Ducks, peaking at 134 on November 14 and last seen on November 23; and good numbers of Coots with counts of 100+ on November 2, the last 2 being recorded December 1. Away from Shirley's Bay, 2 Pintails lingered at Billings Bridge to be tallied on the Christmas count. The now regular male Barrow's Goldeneye remained near the Kitchissippi lookout throughout the period, while a female Harlequin Duck took up residence off Brébeuf Park in Hull on November 5 and will likely stay for the winter.

With the building of the dyke-causeway at Shirley's Bay and the subsequent increase in birding there, Purple Sandpipers are now being found with some regularity. Last year's bird was noted briefly on November 14 as it paused on its southward journey.

Gull watching continued at a breathtaking pace (for more reasons than one), with the Ottawa dump being the centre of attraction for an estimated 5000 gulls throughout November. There was a rapid decline in numbers early in December and by the time the Christmas count was taken on the 21st, only five birds could be found: 1 Glaucous, 1 Iceland, 3 Herring. While Herring Gulls far outnumbered all others, on any given day up to six species could be seen rummaging through the garbage or resting on the surrounding fields. Glaucous Gulls arrived later than usual and not in the numbers of the past few years. They were first seen November 14, and peaked in numbers at 15 on December 9. By contrast, Iceland Gulls were in better numbers than in recent years with a dozen birds being seen up to December 16. Great Black-backed Gulls were in short supply in November but built up to 7 first-year birds on December 16. The biggest surprise among the regulars was the high count of Thayer's Gulls, now one of Ottawa's specialties. No fewer than 16 individuals were involved in sightings over the period, with 1 adult and 3 first-year birds observed on November 17.

The most exciting gull find was not at the dump, but rather, at Britannia pier. On November 11 an adult Laughing Gull in winter plumage was spotted, but unfortunately was only seen once. If accepted by the Bird Records Committee, this will be a first for Ottawa.

Owl news was rather quiet. Snowies could be found in the usual locations -- good numbers but not an invasion. Barred Owls were reported with some frequency, a few right in town. The only other northern owl was a single Hawk Owl, seen November 23 just west of North Gower. Sadly, it was picked up November 25 -- a road fatality.

After the incredible invasion, in the winter of '74-'75, of Three-toed Woodpeckers, this winters incursion seems mild by comparison. Eight Black-backs and 7 Northerns were seen on the Christmas census, a very respectable showing. Gray Jays and Boreal Chickadees were also fairly easy to locate, with 5 and 13 observed, respectively, on the "C.B.C."

Two Carolina Wrens were reported. One was seen throughout the period in the west end of the city on Fraser Avenue. The other was at Carp in early December.

Bohemian Waxwing numbers were up last year, with 139 being tallied on the count. A lingering Yellow-rumped Warbler was frequenting a feeder in early December, capping the excellent fall warbler migration.

A heartily welcomed count of 11 Cardinals scattered throughout the city on the Christmas count, as well as a male at Manotick and a pair at the Jock River-Greenbank Road area, suggests the possibility that this southern beauty may some day be a common resident of our area. Aside from a good number of Snow Buntings, Redpolls are the big name in the finches this season. Most are being seen in weedy fields rather than in forests or at feeders. Patience and careful observation should reveal a few Hoary Redpolls before the winter is out.

At the time this article is being written, we are in the midst of some of the coldest weather bouts in many years. It will be interesting to note how birding for the rest of the winter will be affected by these polar outbreaks.

Brian Morin

MACOUN FIELD CLUB

The Macoun Seniors would like help with their weekly field trips. Trips are held every Sunday and sometimes parents let us down. We need volunteers who wouldn't mind being phoned (occasionally only) on Saturday night and asked to drive the next day. We would especially appreciate people who can come along and contribute their knowledge as well as enjoy the outing. To add your name to the list, or for more information, phone David Gray 998-4141 or 521-9000

O F N C EVENTS IN MARCH AND APRIL

arranged by the Excursions and Lectures Committee
J. Donald Lafontaine (829-7273), Chairman

Saturday 6 March

FIELD TRIP ON CROSS COUNTRY SKIS
Leader: Harry Thomson (234-0845)
Meet: Supreme Court, Wellington Street
Time: 9 a.m.
All day trip; bring lunch and hot beverage.

Sunday 7 March

FIELD TRIP: OWLS AND WINTER BIRDS
Leader: George McGee (733-1739)
Meet: Billings Bridge Shopping Centre
Bank Street at Riverside Drive
Time: 8:30 a.m.
Half-day trip; bring a snack.

Monday 8 March

NPPAC ANNUAL MEETING
ALGONQUIN PARK MASTER PLAN
Speaker: Mr. Andy Brethour of the Ontario Ministry of Natural Resources
Meet: National Museum Auditorium
Metcalfe and McLeod Streets
Time: 8:00 p.m.
A slide illustrated talk and discussion
Refreshments will be served. (See page 41)

Tuesday 9 March

OFNC MONTHLY MEETING
THE SOUNDS OF SPRING
Speaker: Monty Brigham
Meet: Auditorium, Ottawa Public Library
Laurier and Metcalfe Streets
Time: 8:00 p.m.
A follow-up to the lecture last spring; Monty will play and discuss his own recordings.

Saturday 27 March

FIELD TRIP: BIRDING AT PRESQU'ILE PARK
Leader: Steve O'Donnell (737-5270)
Meet: Gate at entrance to Park
Time: 8:30 a.m.
All day trip to see the large flocks of migrating waterfowl, usually including hundreds of Canvasbacks and Redheads. Those wishing to stay overnight should make arrangements with the White House (613-475-0004). All persons planning to make the trip should contact the leader before March 23.

Sunday
11 April

FIELD TRIP: OWLS AND EARLY MIGRANTS
Leader: Bruce Dilabio (728-0350)
Meet: Westgate Shopping Centre
Carling Avenue at Merivale
Time: 7:30 a.m.
Half-day trip; bring a snack.

Tuesday
13 April

OFNC MONTHLY MEETING
SPRING WILDFLOWERS
Speakers: Harry and Sheila Thomson
Meet: Auditorium, Ottawa Public Library
Laurier and Metcalfe Streets
Time: 8:00 p.m.

Tuesday
20 April

ANNUAL DINNER
Meet: Talisman Motor Inn,
Carling Avenue at the Queensway
Time: 7:30 p.m. (Social Hour 6:30 p.m.)
Speakers: John and Janet Foster
Additional details may be found in the centerfold. Make your reservations early!

Saturday
24 April

FIELD TRIP: AMPHIBIANS IN SPRING
Leader: Jim Johnston (820-0293)
Meet: Supreme Court, Wellington Street
Time: 7:30 p.m.
Bring waterproof footwear, a flashlight and dress warmly.

Sunday
25 April

FIELD TRIP: BIRDS AT RAMSAYVILLE MARSH
Leader: Rick Poulin (232-4687)
Meet: Anderson Road at CN tracks north of Russel Road
Time: 7:00 a.m.
Half-day trip; bring a snack and waterproof footwear.

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